

# Valve Regulated Maintenance-Free-Lead Acid Rechargeable Batteries





VCELL Sealed Lead Acid Rechargeable Battery

Vcell was established in 1993 and specializes in research, development, manufacture and sales of Valve Regulated Lead Acid (VRLA) batteries. The full battery model range includes 2V,4V 6V and 12V, which are widely used in telecom, emergency lighting, alarm systems, security, medical, cordless, and wheelchair industry. Our experience and technical excellence are acclaimed in the VRLA industry.

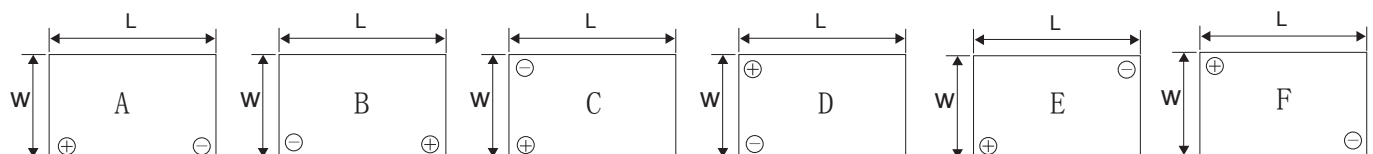


Specifications

Model	Nominal Voltage (V)	Rated Capacity (Ah) 10Hr. To 1.75V/Cell	Dimensions (in)mm				Weight (Lb) kg	Terminal Type
			Length	Width	Height	Overall Height		
<b>TCM 2V TELECOM/UPS (10 Year Design)</b>								
2TCM100	2	100	(3.15)80	(6.85)174	(8.74)222	(9.61)244	(16.54)7.50	FP-02
2TCM150	2	150	(6.69)170	(4.17)106	(12.99)330	(13.58)345	(26.46) 12.00	RT-03
2TCM200	2	200	(6.69)170	(4.17)106	(12.99)330	(13.58)345	(33.08)15.00	RT-03
2TCM300	2	300	(6.69)170	(5.91)150	(12.99)330	(13.58)345	(49.61)22.50	RT-03
2TCM350	2	350	(6.69)170	(5.91)150	(12.99)330	(13.58)345	(52.90)24.00	RT-03
2TCM400	2	400	(7.72)196	(6.73)171	(12.99)330	(13.58)345	(66.15)30.00	RT-03
2TCM420	2	420	(7.72)196	(6.73)171	(12.99)330	(13.58)345	(67.24)30.50	RT-03
2TCM500	2	500	(9.49)241	(6.73)171	(12.99)330	(13.58)345	(80.26)36.40	RT-03
2TCM600	2	600	(11.22)285	(6.73)171	(12.99)330	(13.58)345	(99.23)45.00	RT-03
2TCM800	2	800	(15.08)383	(6.73)171	(12.99)330	(13.58)345	(136.71)62.00	RT-03
2TCM1000	2	1,000	(18.54)471	(6.73)171	(12.99)330	(13.58)345	(160.97)73.00	RT-03
2TCM1600	2	1,600	(18.74)476	(13.27)337	(12.99)330	(13.58)345	(275.63)125.00	RT-03
2TCM2000	2	2,000	(18.74)476	(13.27)337	(12.99)330	(13.58)345	(321.93)146.00	RT-03
2TCM3000	2	3,000	(27.40)696	(13.39)340	(12.99)330	(13.58)345	(485.10)220.00	RT-03
<b>FT 12V TELECOM (10 Year Design)</b>								
12FT55	12	55	(10.91)277	(41.73) 106	(8.74) 222	(8.74) 222	(41.89)19.00	RT-02
12FT75	12	75	(22.13) 562	(4.49) 114	(74.02) 188	(74.02) 188	(61.73)28.00	RT-01
12FT100	12	100	(19.96) 507	(4.33) 110	(9.37) 238	(9.37) 238	(77.16)35.00	RT-01
12FT105	12	105	(16.54) 420	(4.33) 110	(11.61) 295	(11.61) 295	(83.78)38.00	RT-02
12FT150	12	150	(21.69) 551	(4.33) 110	(11.34) 287	(11.34) 287	(104.72)47.50	RT-02
12FT165	12	165	(20.83) 529	(4.96) 125	(12.40) 315	(12.40) 315	(123.46)56.00	RT-02



Terminal Location

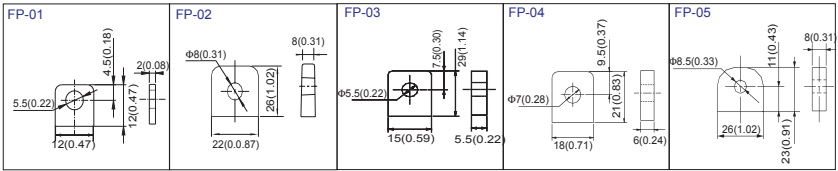


Model	Nominal Voltage (V)	Rated Capacity (Ah) 20Hr. To 1.75V/Cell	Dimensions (in)mm				Weight (Lb) kg	Layout	Terminal Type
			Length	Width	Height	Overall Height			
<b>VC GENERAL PURPOSE ( 5 Year Design )</b>									
4VC4.5	4	4.5	(1.86) 47.3	(1.86) 47.3	(3.94) 100	(4.13) 105	(1.21) 0.55	B	FO-01
6VC1.0	6	1.0	(2.01) 51	(1.65) 42	(2.03) 51.5	(2.30) 58.5	(0.62) 0.28	A	FO-01
6VC1.3	6	1.3	(3.82) 97	(0.94) 24	(2.05) 52	(2.32) 59	(0.73) 0.33	A	FO-01
6VC3.4	6	3.4	(5.28)134	(1.34) 34	(2.36) 60	(2.64) 67	(1.52) 0.69	A	FO-01
6VC3.5	6	3.5	(7.68)195	(0.96) 24.5	(1.99) 50.5	(2.26) 57.5	(1.46) 0.66	A	FO-01 / FO-02
6VC4.0	6	4.0	(2.76) 70	(1.85) 47	(3.98) 101	(4.21) 107	(1.76) 0.80	E	FO-01 / FO-02
6VC4.5	6	4.5	(2.76) 70	(1.85) 47	(3.98) 101	(4.21) 107	(1.85) 0.84	E	FO-01 / FO-02
6VC5.0	6	5.0	(2.76) 70	(1.85) 47	(3.98) 101	(4.21) 107	(1.98) 0.90	E	FO-01 / FO-02
6VC7.0	6	7.2	(5.94)151	(1.34) 34	(3.70) 94	(3.94) 100	(2.54) 1.15	A	FO-01 / FO-02
6VC7.2	6	7.2	(5.94)151	(1.34) 34	(3.70) 94	(3.94) 100	(2.67) 1.21	A	FO-01 / FO-02
6VC8.5	6	8.5	(3.86) 98	(2.21) 56	(4.65) 118	(4.65) 118	(3.52) 1.60	E	FO-01 / FO-02
6VC10	6	10.0	(5.94)151	(1.97) 50	(3.64) 92.5	(3.94) 100	(4.06) 1.84	A	FO-01 / FO-02
6VC12	6	12.0	(5.94)151	(1.97) 50	(3.64) 92.5	(3.94) 100	(4.61) 2.09	A	FO-01 / FO-02
6VC12T	6	12.0	(4.25)108	(2.76) 70	(5.51) 140	(5.51) 140	(6.53) 2.96	/	PI-03 / PI-04
6VC14	6	14.0	(4.25)108	(2.76) 70	(5.51) 140	(5.51) 140	(5.51) 2.50	/	FO-02(+), FO-01(-)
6VC20	6	20.0	(6.18) 157	(3.27) 83	(4.92) 125	(4.92) 125	(10.58) 4.80	A	FP-01
6VC33	6	33.0	(6.25)159	(3.35)85	(6.50)165	(6.95)176	(13.70)6.20	F	FP-01
6VC155	6	155.0	(10.2)259	(7.09)180	(9.70)247	(10.12)257	(63.95)29.00	E	RT-03
6VC165	6	165.0	(10.2)259	(7.09)180	(9.70)247	(10.12)257	(64.59)29.30	E	RT-03
6VC200	6	200.0	(9.92)252	(4.92)125	(14.37)365	(15.16)385	(77.2)35.00	E	RT-03
6VC225	6	225.0	(9.92)252	(4.92)125	(14.37)365	(15.16)385	(79.38)36.00	E	RT-03
12VC0.8	12	0.8	(3.78) 96	(0.98) 25	(2.44) 62	(2.44) 62	(0.82) 0.37	/	PI-01 / PI-02
12VC1.3	12	1.3	(3.82) 97	(1.69) 43	(2.05) 52	(2.32) 59	(1.34) 0.61	C	FO-01
12VC2.0SLM	12	2.0	(5.91)150	(0.81) 20.5	(3.48) 88.3	(3.48) 88.3	(1.56) 0.71	/	PC-01
12VC2.2	12	2.2	(7.01)178	(1.38) 35	(2.36) 60	(2.64) 67	(2.07) 0.94	A	FO-01
12VC2.3V	12	2.0	(7.17)182	(0.94) 24	(2.43) 61.7	(2.43) 61.7	(1.65) 0.75	/	PC-02
12VC2.9	12	2.9	(3.11) 79	(2.20) 56	(3.90) 99	(4.13) 105	(2.67) 1.21	B	FO-01
12VC3.0R	12	3.0	(5.20) 132	(1.30) 33	(3.86) 98	(4.09) 104	(2.65) 1.20	A	FO-01
12VC3.0S	12	3.0	(2.60) 66	(2.60) 66	(3.86) 98	(4.09) 104	(2.65) 1.20	C	FO-01
12VC3.4	12	3.4	(5.28) 134	(2.64) 67	(2.36) 60	(2.64) 67	(3.02) 1.37	C	FO-01
12VC4.0	12	4.0	(3.54) 90	(2.76) 70	(3.98) 101	(4.21) 107	(3.48) 1.58	A	FO-01 / FO-02
12VC4.5	12	4.5	(3.54) 90	(2.76) 70	(3.98) 101	(4.21) 107	(3.61) 1.64	A	FO-01 / FO-02
12VC5.0	12	5.0	(3.54) 90	(2.76) 70	(3.98) 101	(4.21) 107	(4.03) 1.83	A	FO-01 / FO-02
12VC7.0	12	7.2	(5.94) 151	(2.56) 65	(3.70) 94	(3.94) 100	(5.18) 2.35	D	FO-01 / FO-02
12VC7.2	12	7.2	(5.94) 151	(2.56) 65	(3.70) 94	(3.94) 100	(5.40) 2.45	D	FO-01 / FO-02
12VC10	12	10.0	(5.94) 151	(3.86) 98	(3.70) 94	(3.94) 100	(7.76) 3.52	D	FO-01 / FO-02
12VC12	12	12.0	(5.94) 151	(3.86) 98	(3.70) 94	(3.94) 100	(8.82) 4.00	D	FO-01 / FO-02
12VC18	12	18.0	(7.13) 181	(2.99) 76	(6.58) 167	(6.58) 167	(12.79) 5.80	B	FO-02/FP-01/RT-01
12VC26	12	26.0	(6.54) 166	(6.89) 175	(4.92) 125	(4.92) 125	(18.30) 8.30	C	FP-01/RT-01
12VC28	12	28.0	(6.54) 166	(4.92) 125	(6.89) 175	(6.89) 175	(21.00) 9.80	C	FP-01/RT-01
12VC32	12	32.0	(7.80) 198	(5.12) 130	(6.22) 158	(7.01) 178	(25.58) 11.60	A	RT-01/FP-07
12VC35	12	35.0	(7.80) 198	(5.12) 130	(6.22) 158	(7.01) 178	(26.02) 11.8	A	RT-01/FP-07
12VC38	12	38.0	(7.80) 198	(5.20) 132	(6.69) 170	(6.69) 170	(28.06) 12.73	A	RT-01/FP-07
12VC40	12	40.0	(7.76) 197	(6.50) 165	(6.69) 170	(6.69) 170	(28.89) 13.1	B	RT-02 / FP-03
12VC55	12	55.0	(9.02) 229	(5.43) 138	(8.15) 207	(8.86) 225	(39.25) 17.8	A	FP-04 / RT-02
12VC65	12	65.0	(10.69)271.5	(6.54) 166	(7.48) 190	(7.55) 191.8	(48.51) 22.00	B	FP-04 / RT-02
12VC70	12	70.0	(13.78) 350	(6.54) 166	(6.85) 174	(6.85) 174	(49.61) 22.5	B	FP-04 / RT-02
12VC80	12	80.0	(10.24) 260	(6.65) 169	(8.19) 208	(8.31) 211	(58.43) 26.5	A	RT-02
12VC90	12	90.0	(12.01) 305	(6.61) 168	(8.17) 207.5	(9.04) 229.5	(68.36) 31.0	A	FP-02 / RT-02
12VC100	12	100.0	(12.95)329	(6.77) 172	(8.43) 217	(8.70) 221	(70.56) 32.00	A	RT-02
12VC110	12	110.0	(16.02) 407	(6.81) 173	(8.27) 210	(9.25) 235	(74.97) 34.00	A	FP-05 / RT-02
12VC120	12	120.0	(16.02) 407	(6.81) 173	(8.27) 210	(9.25) 235	(79.38) 36.00	A	FP-05 / RT-02
12VC135	12	135.0	(13.58) 345	(6.77) 172	(10.83) 275	(10.94) 278	(101.43) 46.00	A	RT-02
12VC150	12	150.0	(19.1) 485	(6.77)172	(9.57) 243	(9.57) 243	(103.64)47.00	A	FP-05 / RT-03
12VC200	12	200.0	(20.47) 520	(10.24) 260	(8.27) 210	(9.45) 240	(143.33) 65.00	C	FP-08 / RT-03

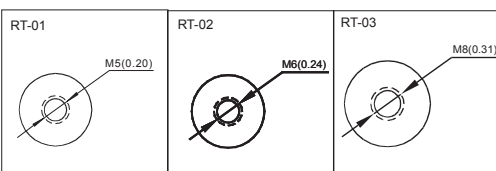
Model	Nominal Voltage (V)	Rated Capacity (Ah) 20Hr. To 1.75V/Cell	Dimensions (in)mm				Weight (Lb) kg	Layout	Terminal Type
			Length	Width	Height	Overall Height			
<b>VHC DEEP / HIGH CYCLE</b>									
12VHC18	12	18.0	(7.13) 181	(2.99) 76	(6.58) 167	(6.58) 167	(13.17) 5.97	B	FO-02/FP-01/RT-01
12VHC26	12	26.0	(6.54) 166	(6.89) 175	(4.92) 125	(4.92) 125	(21.05) 9.55	C	FP-01/RT-01
12VHC35	12	35.0	(7.80) 198	(5.20) 132	(6.69) 170	(6.69) 170	(33.07) 15.00	A	RT-01/ FP-07
<b>VCL LONG LIFE (10 Year Design)</b>									
12VCL7.2	12	7.2	(5.94)151	(2.56) 65	(3.70) 94	(3.94)100	(5.91) 2.68	D	FO-01 / F0-02
12VCL12	12	12.0	(5.94) 151	(3.86) 98	(3.70) 94	(3.94) 100	(8.95) 4.06	D	FO-01 / F0-02
12VCL26	12	26.0	(6.54)166	(6.89) 175	(4.92) 125	(4.92)125	(20.06) 9.10	C	FP-01 / RT-01
12VCL35	12	35.0	(7.80)198	(5.12) 130	(6.22) 158	(7.01) 178	(27.56) 12.50	A	RT-01 / FP-07
12VCL40	12	40.0	(7.76) 197	(6.50) 165	(6.69) 170	(6.69)170	(31.97) 14.50	B	RT-02 / FP-03
12VCL55	12	55.0	(9.02) 229	(5.43) 138	(8.15) 207	(8.86) 225	(41.89) 19.00	A	FP-06 / RT-02
12VCL70	12	70.0	(13.78) 350	(6.54) 166	(6.85) 174	(6.85) 174	(53.13) 24.10	B	FP-04 / RT-02
12VCL80	12	80.0	(10.24) 260	(6.65) 169	(8.19) 208	(8.31) 211	(61.84) 28.05	A	RT-02
12VCL90	12	90.0	(12.01) 305	(6.61) 168	(8.17) 207.5	(9.04) 229.5	(73.85) 33.50	A	FP-02 / RT-02
12VCL100	12	100.0	(12.95) 329	(6.77) 172	(8.43) 217	(8.70) 221	(76.06) 34.50	A	RT-02
12VCL110	12	100.0	(16.02) 407	(6.81) 173	(8.27) 210	(9.25) 235	(81.13) 36.80	A	FP-05 / RT-02
12VCL120	12	120.0	(16.02) 407	(6.81) 173	(8.27) 210	(9.25) 235	(87.74) 39.80	A	FP-05 / RT-02
12VCL135	12	135.0	(13.58) 345	(6.77) 172	(10.83) 275	(10.94) 278	(105.82) 48.00	A	RT-02
12VCL150	12	150.0	(19.10) 485	(6.77) 172	(9.57) 243	(9.57) 243	(108.05) 49.00	A	FP-05 / RT-03
12VCL200	12	200.0	(20.47) 520	(10.24) 260	(8.27) 210	(9.45) 240	(167.55) 76.00	C	FP-08 / RT-03
Model	Nominal Voltage (V)	Rated Capacity Watts Per Cell to 15 min at 1.70VPC	Dimensions (in)mm				Weight (Lb) kg	Layout	Terminal Type
			Length	Width	Height	Overall Height			
<b>VHR HIGH RATE , UPS ( 5 Year Design )</b>									
6VHR21W	6	21	(5.94) 151	(1.34) 34	(3.70)94	(3.94)100	(3.15) 1.43	A	FO-01/FO-02
12VHR21W	12	21	(5.47) 139	(1.89) 48	(4.04) 102.5	(4.25) 108	(4.63) 2.10	A	FO-04(+)/FO-03(-)
12VHR24W	12	24	(5.94) 151	(2.01) 51	(3.74) 95	(3.98) 101	(4.83) 2.19	A	FO-01 / FO-02
12VHR36W	12	36	(5.94) 151	(2.56) 65	(3.70) 94	(3.94) 100	(6.40) 2.90	D	FO-01/FO-02
12VHR54W	12	54	(5.94) 151	(3.86) 98	(3.70) 94	(3.94) 100	(9.02) 4.09	D	FO-01/FO-02
12VHR80W	12	80	(7.13) 181	(2.99) 76	(6.58) 167	(6.58) 167	(14.11) 6.40	B	RT-01
12VHR150W	12	150	(7.80) 198	(5.12) 130	(6.22) 158	(7.01) 178	(27.56) 12.5	A	RT-01
12VHR200W	12	200	(9.02) 229	(5.43) 138	(8.15) 207	(8.86) 225	(40.79) 18.5	A	RT-02
12VHR300W	12	300	(10.24) 260	(6.65) 169	(8.19) 208	(8.31) 211	(59.54) 27.0	A	RT-02
12VHR400W	12	400	(12.95)329	(6.77) 172	(8.43) 217	(8.70) 221	(74.97) 34.00	A	RT-02
12VHR475W	12	475	(13.58) 345	(6.77) 172	(10.83) 275	(10.94) 278	(103.64) 47.00	A	RT-02

**Terminal Configurations mm (inch)**

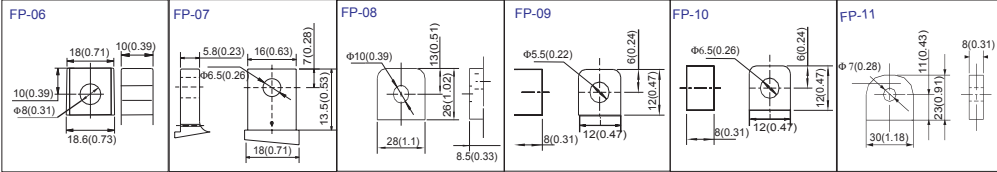
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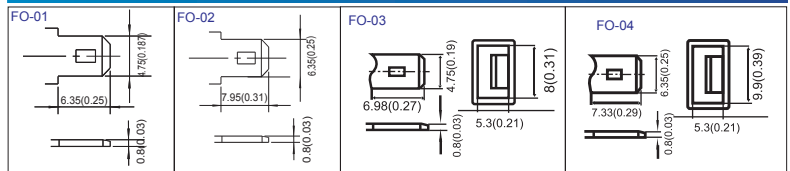
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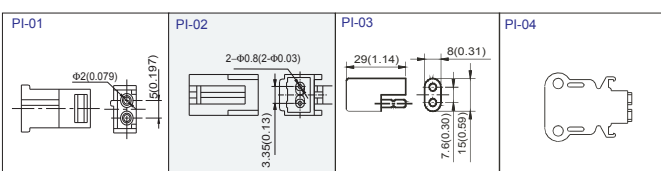
**FP**



**FO**



**PI**



## Vcell Charging Information

Application	Charging Method	Charging Voltage @25°C (V/cell)	Temperature Compensation Coefficient of Charging Voltage mV/°C/cell*	Max. Charging Current (A)	Charging Time 0.1CA@25°C (hr)		Temp °C (°F)
					100% Discharge	50% Discharge	
For Standby Use	Constant Voltage Charging (with Current Restriction)	2.25~2.30	~ 3.3 (~ 1.8mV/°C/cell)	0.3C	T≥24	T≥20	0 ~ 40 (32 ~ 104)
For Cycle Use		2.40~2.50	~ 5 (~ 2.8mV/°C/cell)	0.3C	16<T<24	10<T<24	

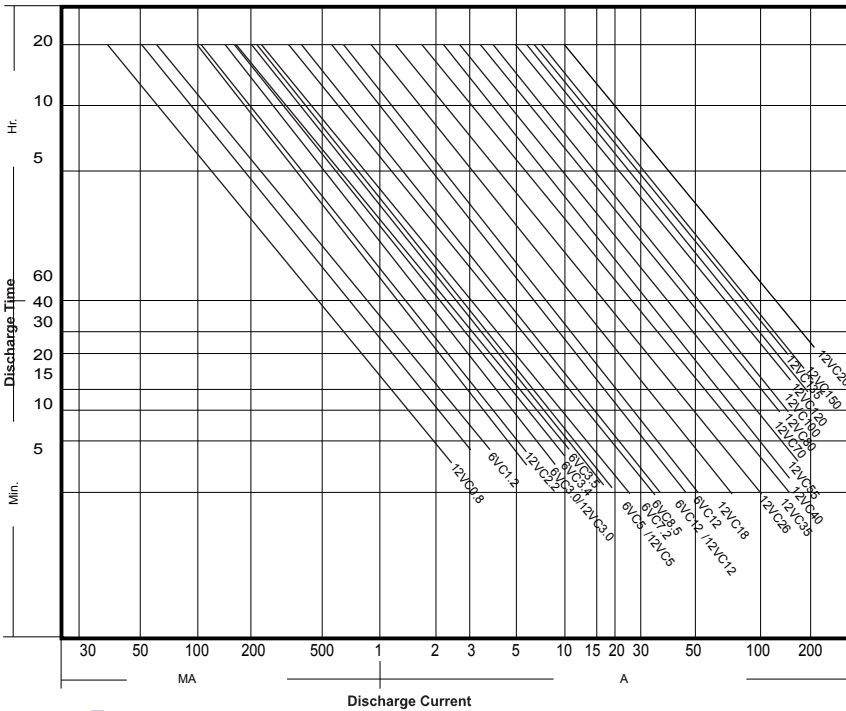
\*Temperature compensation of charging voltage is not needed when using the batteries within 5°C to 35°C range.

## Vcell Optimum temperature ranges

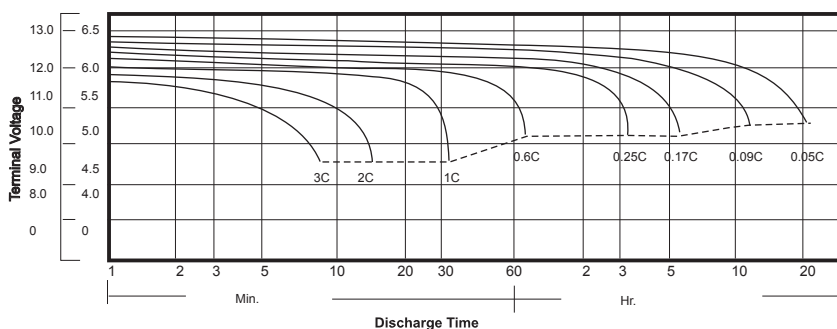
<b>Discharge</b>	15 ~ 40°C	59 ~ 104°F
<b>Charge</b>	0 ~ 40°C	32 ~ 104°F
<b>Storage</b>	15 ~ 40°C	59 ~ 104°F

\*Batteries can be used in environments ranging from -40°C to 60°C. Please note that extreme temperatures will have a negative effect on battery life and performance.

## Vcell Discharge Current vs Time Curve 25°C(77°F)



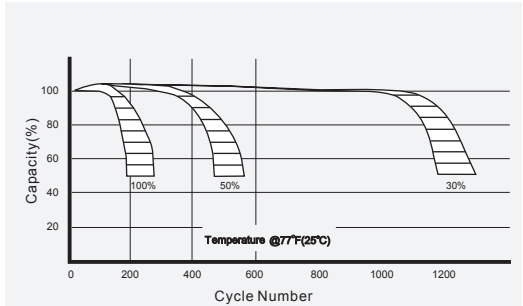
## Vcell Discharge Characteristics



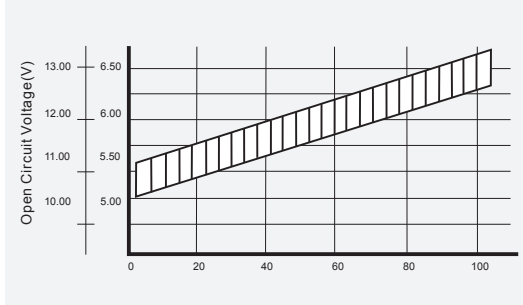
## Vcell Discharge current vs final discharge Voltage

Discharge Current (A)	Final Discharge Voltage (V/cell)
$C_A < 0.01C$	1.90
$0.01C \leq C_A < 0.2C$	1.75
$0.2C \leq C_A < 0.5C$	1.70
$0.5C \leq C_A < 3.0C$	1.60
$3.0C \leq C_A$	1.30

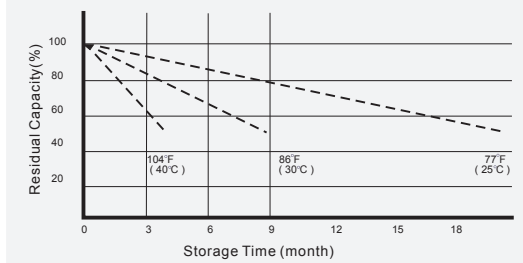
## Vcell Cycle Life vs Depth Of Discharge



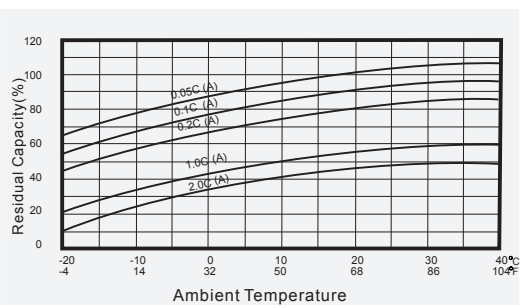
## Vcell Open Circuit Voltage Vs Residual Capacity



## Vcell Shelf-Life vs Storage Temperature



## Vcell Effect Of Temperature On Capacity



## Vcell Charging and handling Precautions

### Handling & Safety Information

- Never place or dispose of the battery near or in a fire.
- Never short the terminals.
- Never operate the battery in a gastight container.
- Never disassemble the battery.
- Never clean the ABS battery surface with detergent or organic solvents.
- VCELL batteries contain dilute sulfuric acid and in the even of contact with the skin or clothing, the exposed areas should be flushed generously with water and the injured party should seek immediate medical attention.

\* All of the graphs shown in this catalogue apply to the VC series only. For other series technical information, please consult the specific technical specification sheet for that model. Specifications subject to change without notification.

### Charging

- Always charge the batteries in an open, wellventilated area.
- Do not charge the batteries near equipment that may produce sparks.
- Do not charge near an open flame.
- Do not allow the use of smoking materials in battery charging area.
- Electrolysis may cause hydrogen and oxygen to be released toward the end of a charging cycle or in the event the battery is overcharged. The combination of hydrogen and oxygen can result in an explosion if a spark or a flame is present.





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